

VI. CLAIMS

We claim:

1. An apparatus to convert a liquid to a gas, comprising:
 - 5 a. a liquid source;
 - b. a liquid pressurization element responsive to said liquid source;
 - c. a liquid transfer element coupled to said liquid pressurization element;
 - d. a burner tube having an interior surface and an exterior surface, and wherein said burner tube has a first end and a second end;
 - 10 e. a burner located within said burner tube; and
 - f. at least one nozzle coupled to said liquid transfer element, wherein said at least one nozzle has a location within said burner tube, and wherein heat from said burner is responsive to said at least one nozzle.
- 15 2. An apparatus to convert a liquid to a gas as described in claim 1, where in said burner tube has a substantially cylindrical configuration.
3. An apparatus to convert a liquid to a gas as described in claim 2, wherein said substantially cylindrical configuration has a diameter of about fourteen inches (about
20 0.36 meters).
4. An apparatus to convert a liquid to a gas as described in claim 3, wherein said burner tube comprises Schedule 40 pipe.
- 25 5. An apparatus to convert a liquid to a gas as described in claim 2, wherein said burner tube has a length of about twelve feet (about 3.65 meters).
6. An apparatus to convert a liquid to a gas as described in claim 2, wherein said burner tube has a longitudinal axis substantially horizontal to a supporting surface.
- 30 7. An apparatus to convert a liquid to a gas as described in claim 6, further comprising a burner stack coupled to said burner tube, wherein said burner stack has a

longitudinal axis substantially perpendicular to the longitudinal axis of said burner tube.

- 5 8. An apparatus to convert a liquid to a gas as described in claim 7, wherein said burner stack has a substantially cylindrical configuration.
9. An apparatus to convert a liquid to a gas as described in claim 8, wherein said burner stack has diameter of about fourteen inches (about 0.36 meters).
- 10 10. An apparatus to convert a liquid to a gas as described in claim 9, wherein said burner stack comprises Schedule 40 pipe.
11. An apparatus to convert a liquid to a gas as described in claim 7, further comprising an end cap coupled to said second end of said burner tube.
- 15 12. An apparatus to convert a liquid to a gas as described in claim 2, wherein said burner tube has a substantially vertical orientation to said supporting surface.
13. An apparatus to convert a liquid to a gas as described in claim 1, wherein said burner
20 comprises a SB 38/24-14 2.5 MM BTU per hour.
14. An apparatus to convert a liquid to a gas as described in claim 13, wherein said burner uses natural gas as a fuel.
- 25 15. An apparatus to convert a liquid to a gas as described in claim 14, wherein said natural gas is derived in situ from a natural gas well.
16. An apparatus to convert a liquid to a gas as described in claim 1, wherein said at
least one nozzle disperses said liquid at a rate between about four gallons per minute
30 to about twelve gallons per minute (about 18 liters per minute to about 54 liters per minute).

17. An apparatus to convert a liquid to a gas as described in claim 16, wherein said burner generates a flame, and wherein said liquid dispersed from said at least one nozzle is applied directly to said flame.
- 5 18. An apparatus to convert a liquid to a gas as described in claim 16, wherein said at least one nozzle disperses said liquid as a spray.
19. An apparatus to convert a liquid to a gas as described in claim 1, wherein said liquid pressurization element establishes said liquid at a pressure between 100 pounds per square inch and 3000 pounds per square inch within said liquid transfer element.
- 10 20. An apparatus to convert a liquid to a gas as described in claim 19, wherein said liquid transfer element has an inside diameter of about one-quarter inch to about one inch (about 0.64 centimeters to about 2.54 centimeters).
- 15 21. An apparatus to convert a liquid to a gas as described in claim 1, further comprising a cooling element coupled to a portion of said exterior surface of said burner tube.
22. An apparatus to convert a liquid to a gas as described in claim 21, wherein said liquid circulates through said cooling element prior to being dispersed by said nozzle.
- 20 23. An apparatus to convert a liquid to a gas as described in claim 1, further comprising a liquid preheating element coupled to said liquid transfer element.
- 25 24. An apparatus to convert a liquid to a gas as described in claim 23, wherein said liquid preheating element is responsive to said exterior surface of said burner tube, and wherein said liquid preheating element conducts heat from said exterior surface of said burner tube to said liquid.
- 30 25. An apparatus to convert a liquid to a gas as described in claim 23, wherein said liquid preheating element has a location within said burner tube, and wherein said liquid preheating element conducts heat from said flame of said burner to said liquid.

26. An apparatus to convert a liquid to a gas as described in claim 23, wherein said liquid preheating element comprises a coil of metal tube.
- 5 27. An apparatus to convert a liquid to a gas as described in claim 26, wherein said metal tube has an internal diameter between about one-half inch to about one and one half inches (about 1.3 centimeters to about 3.8 centimeters).
28. An apparatus to convert a liquid to a gas as described in claim 26, wherein said
10 metal tube has a length between about two feet to about forty feet (about 0.61 meters to about 12.2 meters).
29. An apparatus to convert a liquid to a gas as described in claim 23, wherein said liquid is heated to a temperature between about 150 degrees Fahrenheit to about
15 1000 degrees Fahrenheit (about 65.6 degrees Celsius to about 537.8 degrees Celsius).
30. An apparatus to convert a liquid to a gas as described in claim 1, further comprising a concentration of other substances in said liquid.
- 20 31. An apparatus to convert a liquid to a gas as described in claim 30, further comprising a solids deposition surface on which solids accumulate when said liquid converts to gas.
32. An apparatus to convert a liquid to a gas as described in claim 31, wherein said
25 solids deposition surface comprises a portion of said interior surface of said burner tube.
33. An apparatus to convert a liquid to a gas as described in claim 31, further comprising a condensation surface on which a portion of said gas condenses.
- 30 34. An apparatus to convert a liquid to a gas as described in claim 33, wherein said condensation surface comprises a portion of said interior surface of said burner tube.

35. An apparatus to convert a liquid to a gas as described in claim 33, further comprising a condensate transfer surface responsive to said condensation surface and said solids deposition surface.
- 5 36. An apparatus to convert a liquid to a gas as described in claim 1, further comprising a gas expansion compensator responsive to an increased volume of gas within said burner tube, wherein said gas expansion compensator generates a pressure gradient having sufficient change in atmospheric pressure per unit distance to move said increased volume of gas away from said flame of said burner.
- 10 37. An apparatus to convert a liquid to a gas as described in claim 36, wherein said gas expansion compensator comprises said liquid dispersed through said nozzle at a rate sufficient to establish said pressure gradient within said burner tube.
- 15 38. An apparatus to convert a liquid to a gas as described in claim 1, further comprising an arrester coupled to said first end of said burner tube.
39. An apparatus to convert a liquid to a gas as described in claim 38, wherein said arrester comprises an expansion chamber and restrictor elements.
- 20 40. A method of converting a liquid to a gas, comprising the steps of:
- a. providing a liquid;
 - b. pressurizing said liquid;
 - c. transferring said liquid to a nozzle located within a burner tube having an exterior surface and a first end;
 - 25 d. dispersing said liquid at an aperture of said nozzle into heat generated by a burner located within said burner tube;
 - e. converting at least a portion of said liquid to a gas.
41. A method of converting a liquid to a gas as described in claim 40, wherein said step
30 of dispersing said liquid at an aperture of said nozzle into heat generated by a burner located within said burner tube comprises dispersing said liquid directly into a flame generated by said burner.

42. A method of converting a liquid to a gas as described in claim 40, wherein said step of pressurizing said liquid comprises pressurizing said liquid to between about 100 pounds per square inch to about 3000 pounds per square inch.
- 5 43. A method of converting a liquid to a gas as described in claim 40, further comprising the step of cooling said exterior surface of said burner tube.
44. A method of converting a liquid to a gas as described in claim 40, further comprising the step of preheating said liquid prior to dispersing said liquid at said aperture of
10 said nozzle.
45. A method of converting a liquid to a gas as described in claim 44, wherein said step of preheating said liquid prior to dispersing said liquid at said aperture of said nozzle comprises increasing the temperature of said liquid to between about 150 degrees
15 Fahrenheit to about 1000 degrees Fahrenheit (about 65.6 degrees Celsius to about 537.8 degrees Celsius).
46. A method of converting a liquid to a gas as described in claim 40, further comprising the step of depositing solids dissolved in said liquid to a deposition surface as said
20 liquid converts to gas.
47. A method of converting a liquid to a gas as described in claim 46, further comprising the step of condensing a portion of said gas to a condensation surface.
- 25 48. A method of converting a liquid to a gas as described in claim 47, further comprising the step of transferring condensate to said solids using a condensate transfer surface.
49. A method of converting a liquid to a gas as described in claim 47, wherein said condensate and said solids produce a solution.
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50. A method of converting a liquid to a gas as described in claim 49, further comprising the step of collecting said solution at a location outside of said burner tube.

51. A method of converting a liquid to a gas as described in claim 49, wherein said step of collecting said solution at a location outside of said burner tube occurs continuously as said liquid is converted to said gas.
- 5 52. A method of converting a liquid to a gas as described in claim 40, further comprising the step of moving an increased gas volume away from said flame of said burner.
53. A method of converting a liquid to a gas as described in claim 52, wherein said step of moving an increased gas volume away from said flame of said burner comprises
10 generating a pressure gradient having sufficient change in atmospheric pressure per unit distance to move said increased gas volume within said burner tube, and wherein generating said pressure gradient comprises dispersing said liquid through said nozzle.
- 15 54. A method of converting a liquid to a gas as described in claim 40, further comprising the step of arresting substances at said first end of said burner tube.
55. A method of converting a liquid to a gas as described in claims 41, 42, 44, 46, 52, or 54, further comprising the step of orienting the longitudinal axis of said burner tube
20 substantially horizontal to a supporting surface.
56. A method of converting a liquid to a gas as described in claims 41, 42, 44, 46, 52, or 54, further comprising the step of orienting the longitudinal axis of said burner tube substantially vertical to a supporting surface, wherein said first end is proximate to
25 said supporting surface.
57. A method of converting a liquid to a gas as described in claims 40, wherein said step of converting at least a portion of said liquid to a gas comprises converting water to steam
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58. Distilled water produced in accordance with the process of claims 41, 42, 44, 46, 52, 54 or 57.

59. Salts produced in accordance with the process of claims 41, 42, 44, 46, 52, 54 or 57.
60. An expanding gas volume produced in accordance with the process of claims 41, 42, 44, 46, 52, 54, or 57.
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61. An apparatus to convert a liquid to a gas, comprising:
- a. a liquid source;
 - b. a pressurization element responsive to said liquid, wherein said pressurization element pressurizes said liquid between 100 pounds per square inch and 3000 pounds per square inch;
 - 10 c. a liquid preheating element, wherein said liquid preheating element heats said liquid to a temperature between about 150 degrees Fahrenheit to about 1000 degrees Fahrenheit (about 65 degrees Celsius to about 538 degrees Celsius);
 - 15 d. at least one nozzle to disperse said liquid;
 - e. an energy source, wherein said energy source generates energy into which said liquid is dispersed, whereby at least a portion of said liquid is converted to gas.
- 20 62. An apparatus to convert a liquid to a gas as described in claim 61, wherein said energy source comprises a burner.
63. An apparatus to convert a liquid to a gas as described in claim 62, wherein said burner comprises an SB 38/24-14 2.5 MM BTU per hour.
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64. An apparatus to convert a liquid to a gas as described in claim 62, wherein said burner uses natural gas as a fuel.
65. An apparatus to convert a liquid to a gas as described in claim 62, wherein said energy generated by said burner comprises a flame.
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66. An apparatus to convert a liquid to a gas as described in claim 65, wherein said flame generates between about one million BTU per hour to about three million BTU per hour.
- 5 67. An apparatus to convert a liquid to a gas as described in claim 61, wherein said nozzle disperses said liquid at a rate between about four gallons per minute to about twelve gallons per minute (about 18 liters per minute to about 54 liters per minute).
68. An apparatus to convert a liquid to a gas as described in claim 67, wherein said
10 nozzle comprises a plurality of nozzles.
69. An apparatus to convert a liquid to a gas as described in claim 61, further comprises a burner tube, wherein said burner and said nozzle have a location within said burner tube.
- 15 70. An apparatus to convert a liquid to a gas as described in claim 69, further comprising a gas expansion compensator responsive to an increased volume of gas within said burner tube, wherein said gas expansion compensator generates a pressure gradient having sufficient change in atmospheric pressure per unit distance to move said
20 increased volume of gas away from said flame of said burner.
71. An apparatus to convert a liquid to a gas as described in claim 70, wherein said gas expansion compensator comprises said liquid dispersed through said nozzle at a rate sufficient to establish said pressure gradient within said burner tube.
- 25 72. An apparatus to convert a liquid to a gas as described in claim 69, further comprising dissolved solids in said liquid.
73. An apparatus to convert a liquid to a gas as described in claim 72, further comprising
30 a solids deposition surface on which solids accumulate when said liquid converts to gas.

74. An apparatus to convert a liquid to a gas as described in claim 73, wherein said solids deposition surface comprises a portion of said interior surface of said burner tube.
- 5 75. An apparatus to convert a liquid to a gas as described in claim 72, further comprising a condensation surface on which a portion of said gas condenses.
76. An apparatus to convert a liquid to a gas as described in claim 75, wherein said condensation surface comprises a portion of said interior surface of said burner tube.
- 10 77. An apparatus to convert a liquid to a gas as described in claim 72, further comprising a condensate transfer surface responsive to said condensation surface and said solids deposition surface.
78. An apparatus to convert a liquid to a gas as described in claim 69, further comprising
15 a liquid preheating element coupled to said liquid transfer element.
79. An apparatus to convert a liquid to a gas as described in claim 78, wherein said liquid preheating element adjoins said exterior surface of said burner tube, and wherein said liquid preheating element conducts heat from said exterior surface of
20 said burner tube to said liquid.
80. An apparatus to convert a liquid to a gas as described in claim 78, wherein said liquid preheating element has a location within said burner tube, and wherein said liquid preheating element conducts heat from said burner to said liquid.
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81. An apparatus to convert a liquid to a gas as described in claim 69, further comprising a cooling element coupled to a portion of said exterior surface of said burner tube.
82. An apparatus to convert a liquid to a gas as described in claim 81, wherein said
30 liquid circulates through said cooling element prior to being dispersed by said nozzle.
83. A method of converting a liquid to a gas, comprising the steps of:

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- a. pressurizing said liquid between about 100 pounds per square inch and 3000 pounds per square inch;
 - b. heating said liquid to a temperature between about 150 degrees Fahrenheit to about 1000 degrees Fahrenheit (about 65 degrees Celsius to about 538 degrees Celsius);
 - c. dispersing an amount of said liquid from at least one nozzle;
 - d. delivering said amount of liquid dispersed from said at least one nozzle into an amount of energy; and
 - e. converting a portion of said liquid to a gas with said amount of energy.

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84. A method of converting a liquid to a gas as described in claim 83, wherein said step of delivering said amount of liquid dispersed from said at least one nozzle into an amount of energy comprises delivering said amount of liquid into a flame generated by a burner.

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85. A method of converting a liquid to a gas as described in claim 84, wherein said step of delivering said amount of liquid into a flame generated by a burner comprises delivering between four gallons per minute and twelve gallons per minute of said liquid into said flame.

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86. A method of converting a liquid to a gas as described in claim 85, further comprising the step of locating said burner and said nozzle within an enclosure.

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87. A method of converting a liquid to a gas as described in claim 86, wherein said step of delivering said amount of liquid dispersed from said at least one nozzle into an amount of energy comprises using a plurality of nozzles.

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88. A method of converting a liquid to a gas as described in claim 86, further comprising the step of moving an increased gas volume away from said flame of said burner, wherein said step of moving an increased gas volume away from said flame of said burner comprises generating a pressure gradient having sufficient change in atmospheric pressure per unit distance to move said increased gas volume within said enclosure.

89. A method of converting a liquid to a gas as described in claim 88, wherein said step of generating a pressure gradient having sufficient change in atmospheric pressure per unit distance to move said increased gas volume comprises dispersing said liquid through said nozzle at a rate sufficient to establish said pressure gradient within said enclosure.
90. A method of converting a liquid to a gas as described in claim 86, further comprising the step of depositing solids dissolved in said liquid to a deposition surface as said liquid converts to gas.
91. A method of converting a liquid to a gas as described in claim 90, further comprising the step of condensing a portion of said gas to a condensation surface.
92. A method of converting a liquid to a gas as described in claim 91, further comprising the step of transferring condensate to said solids using a condensate transfer surface.
93. A method of converting a liquid to a gas as described in claim 92, further comprising the step of collecting a solution of said solids and said condensate at a location outside of said enclosure.
94. A method of converting a liquid to a gas as described in claim 93, further comprising the step of cooling said enclosure.
95. An apparatus to remove dissolved substances from a liquid, comprising:
- a. a liquid containing dissolved substances;
 - b. a liquid-gas converter responsive to said liquid;
 - c. a deposition surface on which solids accumulate as said liquid converts to a gas;
 - d. a condensation surface on which a portion of said gas converts to a condensate; and
 - e. a condensate transfer surface configured to combine said condensate with said solids, whereby at least a portion of said solids are dissolved in said condensate to form a solution.

96. An apparatus to convert a liquid to a gas as described in claim 95, wherein said liquid-gas converter has an interior surface, and wherein a portion of said interior surface defines said deposition surface.
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97. An apparatus to convert a liquid to a gas as described in claim 96, wherein said liquid-gas converter has an interior surface, and wherein a portion of said interior surface defines said condensation surface.
- 10 98. An apparatus to convert a liquid to a gas as described in claim 97, wherein said liquid-gas converter has an interior surface, and wherein a portion of said interior surface defines said condensate transfer surface.
99. An apparatus to convert a liquid to a gas as described in claim 98, further comprising
15 a solution removal system.
100. An apparatus to convert a liquid to a gas as described in claim 99, wherein said solution removal system comprises:
- i. a gravity collection element; and
 - 20 ii. a solution repository.
101. An apparatus to convert a liquid to a gas as described in claims 96, 97, or 98, wherein said interior surface has a substantially cylindrical configuration.
- 25 102. An apparatus to convert a liquid to a gas as described in claim 95, further comprising a pressurization element responsive to said liquid, where said pressurization element pressurizes said liquid between 100 pounds per square inch and 3000 pounds per square inch.
- 30 103. An apparatus to convert a liquid to a gas as described in claim 95, further comprising a liquid preheating element, wherein said liquid preheating element heats said liquid to a temperature between about 150 degrees Fahrenheit to about 1000 degrees Fahrenheit (about 65 degrees Celsius to about 538 degrees Celsius).

104. An apparatus to convert a liquid to a gas as described in claim 95, wherein said liquid-gas converter comprises:
- a. at least one nozzle having an aperture to disperse said liquid;
 - b. an energy source, wherein said energy source generates energy into which said liquid is dispersed.
105. An apparatus to convert a liquid to a gas as described in claim 104, wherein said energy source comprises a burner.
106. An apparatus to convert a liquid to a gas as described in claim 105, wherein said burner comprises an SB 38/24-14 2.5 MM BTU per hour.
107. An apparatus to convert a liquid to a gas as described in claim 106, wherein said burner uses natural gas as a fuel.
108. An apparatus to convert a liquid to a gas as described in claim 107, wherein said energy generated by said burner comprises a flame.
109. An apparatus to convert a liquid to a gas as described in claim 108, wherein said flame generates between about one million BTU per hour to about three million BTU per hour.
110. An apparatus to convert a liquid to a gas as described in claim 104, wherein said nozzle disperses said liquid at a rate between about four gallons per minute to about twelve gallons per minute (about 18 liters per minute to about 54 liters per minute).
111. An apparatus to convert a liquid to a gas as described in claim 110, wherein said nozzle comprises a plurality of nozzles.
112. An apparatus to convert a liquid to a gas as described in claim 104, wherein said at least one nozzle and said energy source have a location within said enclosure.
113. An apparatus to convert a liquid to a gas as described in claim 112, further comprising a gas expansion compensator responsive to an increased volume of gas

within said enclosure, wherein said gas expansion compensator generates a pressure gradient having sufficient change in atmospheric pressure per unit distance to move said increased volume of gas away from said energy source.

5 114. An apparatus to convert a liquid to a gas as described in claim 113, wherein said gas expansion compensator comprises said liquid dispersed through said nozzle at a rate sufficient to establish said pressure gradient.

10 115. An apparatus to convert a liquid to a gas as described in claim 112, further comprising a liquid preheating element coupled to said nozzle.

116. An apparatus to convert a liquid to a gas as described in claim 115, wherein said liquid preheating element adjoins an exterior surface of said enclosure, and wherein said liquid preheating element conducts heat from said exterior surface of said enclosure to said liquid.
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117. An apparatus to convert a liquid to a gas as described in claim 115, wherein said liquid preheating element has a location within said liquid-gas converter, and wherein said liquid preheating element conducts heat from said energy source to said liquid.
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118. An apparatus to convert a liquid to a gas as described in claim 112, further comprising a cooling element coupled to a portion of said exterior surface of said liquid-gas converter.
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119. An apparatus to convert a liquid to a gas as described in claim 118, wherein said liquid circulates through said cooling element prior to being dispersed by said nozzle.

30 120. A method of removing solids from a liquid, comprising the steps of:
a. converting said liquid to a gas;
b. depositing solids dissolved in said liquid on a deposition surface;
c. condensing a portion of said gas on a condensation surface as condensate;

- d. transferring said condensate to said deposition surface using gravitational force ;
- e. dissolving at least a portion of said solids in said condensate to generate a solution;
- 5 e. transferring said solution from said deposition surface using gravitational force; and
- f. removing said solution from within said liquid-gas converter to a solution repository external to said liquid-gas converter as said liquid is converted to gas.

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121. A method of converting a liquid to a gas as described in claim 120, further comprising pressurizing said liquid between about 100 pounds per square inch and 3000 pounds per square inch prior to converting said liquid to said gas.

15 122. A method of converting a liquid to a gas as described in claim 121, further comprising preheating said liquid to a temperature between about 150 degrees Fahrenheit to about 1000 degrees Fahrenheit (about 65 degrees Celsius to about 538 degrees Celsius) prior to converting said liquid to said gas.

20 123. A method of converting a liquid to a gas as described in claim 122, wherein said step of converting said liquid to a gas using a liquid-gas converter comprises converting between about four gallons per minute and about twelve gallons per minute of said liquid to a gas.

25 124. A method of converting a liquid to a gas as described in claim 123, wherein said step of converting said liquid to a gas comprises converting said liquid to a gas in a fixed volume defined by an enclosure having at least two apertures.

30 125. A method of converting a liquid to a gas as described in claim 124, further comprising the step of generating a pressure gradient within said fixed volume of said enclosure having sufficient change in pressure per unit distance to move said gas toward one of said apertures of said enclosure.

126. A method of converting a liquid to a gas as described in claim 125, wherein said step of generating a pressure gradient within said fixed volume of said enclosure having sufficient change in pressure per unit distance to move said gas toward one of said apertures of said enclosure comprises dispersing said liquid from a nozzle within said enclosure.
127. A method of converting a liquid to a gas as described in claim 126, further comprising the step of delivering said liquid dispersed from said nozzle directly into the flame of a burner.
128. A method of converting a liquid to a gas as described in claim 127, further comprising the step of configuring said enclosure substantially cylindrically.
129. A method of converting a liquid to a gas as described in claim 128, further comprising the step of orienting the longitudinal axis of said cylinder substantially horizontal to a support surface.
130. A method of converting a liquid to a gas as described in claim 128, further comprising the step of orienting the longitudinal axis of said cylinder substantially vertically to said support surface.
131. An apparatus to convert liquid to gas, comprising:
- a liquid;
 - a liquid-gas converter responsive to said liquid, wherein said liquid-gas converter has a location within an enclosure having at least two apertures;
 - a gas expansion compensator, wherein said gas expansion compensator generates a pressure gradient with said liquid prior to conversion of said liquid to gas, and wherein said pressure gradient has sufficient change in atmospheric pressure per unit distance to move the volume of gas generated from said liquid toward one of said at least two apertures
132. An apparatus to convert liquid to gas as described in claim 131, wherein said gas expansion compensator further comprises a nozzle to disperse said liquid.

133. An apparatus to convert liquid to gas as described in claim 132, further comprising a liquid pressurization element responsive to said liquid.
- 5 134. An apparatus to convert liquid to gas as described in claim 133, wherein said liquid pressurization element pressurizes said liquid to a pressure between about 100 pounds per square inch and 3000 pounds per square inch.
- 10 135. An apparatus to convert liquid to gas as described in claim 133, further comprising a preheating element, wherein said liquid preheating element heats said liquid to a temperature between about 150 degrees Fahrenheit to about 1000 degrees Fahrenheit (about 65 degrees Celsius to about 538 degrees Celsius).
- 15 136. An apparatus to convert a liquid to a gas as described in claim 135, wherein said nozzle disperses said liquid at a rate between about four gallons per minute to about twelve gallons per minute (about 18 liters per minute to about 54 liters per minute).
137. An apparatus to convert a liquid to a gas as described in claim 136, wherein said enclosure has an interior surface, and wherein a portion of said interior surface defines said deposition surface.
- 20 138. An apparatus to convert a liquid to a gas as described in claim 137, wherein said liquid-gas converter has an interior surface, and wherein a portion of said interior surface defines said condensation surface.
- 25 139. An apparatus to convert a liquid to a gas as described in claim 138, wherein said liquid-gas converter has an interior surface, and wherein a portion of said interior surface defines said condensate transfer surface.
- 30 140. An apparatus to convert a liquid to a gas as described in claims 137, 138, or 139, wherein said interior surface has a substantially cylindrical configuration.
141. An apparatus to convert a liquid to a gas as described in claim 139, further comprising a solution removal system.

142. An apparatus to convert a liquid to a gas as described in claim 141, wherein said solution removal system comprises:
- i. a gravity collection element; and
 - 5 ii. a solution repository.
143. An apparatus to convert a liquid to a gas as described in claim 141, further comprising a cooling element coupled to a portion of an exterior surface of said enclosure.
- 10 144. An apparatus to convert a liquid to a gas as described in claim 143, wherein said liquid circulates through said cooling element prior to being dispersed by said nozzle.
- 15 145. A method of converting a liquid to a gas, comprising the steps of:
- a. dispersing a liquid;
 - b. converting said liquid to a gas within an enclosure having at least two apertures;
 - c. generating a pressure gradient by dispersing said liquid prior to conversion
- 20 of said liquid to said gas, wherein said pressure gradient has sufficient change in atmospheric pressure per unit distance to move the volume of gas generated from said liquid toward one of said at least two apertures.
146. A method of converting a liquid to a gas as described in claim 145, wherein said step
- 25 of converting said liquid to a gas comprises converting between about four gallons per minute and about twelve gallons per minute (18 liters per minute to about 54 liters per minute) of said liquid to a gas.
147. A method of converting a liquid to a gas as described in claim 146, further
- 30 comprising pressurizing said liquid between about 100 pounds per square inch and 3000 pounds per square inch prior to converting said liquid to said gas.

148. A method of converting a liquid to a gas as described in claim 147, further comprising preheating said liquid to a temperature between about 150 degrees Fahrenheit to about 1000 degrees Fahrenheit (about 65 degrees Celsius to about 538 degrees Celsius) prior to converting said liquid to said gas.

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149. A method of converting a liquid to a gas as described in claim 145, wherein said step of dispersing said liquid comprises dispersing said liquid from a nozzle.

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150. A method of converting a liquid to a gas as described in claim 145, converting said liquid to a gas within an enclosure having at least two apertures comprises dispersing said liquid into a flame of a burner.

151. A method of converting a liquid to a gas as described in claim 150, further comprising the steps of:
- a. locating said nozzle within said enclosure; and
 - b. locating said burner within said enclosure.
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152. A method of converting a liquid to a gas as described in claim 151, further comprising the step of configuring said enclosure substantially as a cylinder.
153. A method of converting a liquid to a gas as described in claim 152, further comprising the step of orienting the longitudinal axis of said cylinder substantially horizontal to a support surface.
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154. A method of converting a liquid to a gas as described in claim 152, further comprising the step of orienting the longitudinal axis of said cylinder substantially vertically to said support surface.
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155. A method of converting a liquid to a gas as described in claim 145, further comprising the step of depositing solids dissolved in said liquid to a deposition surface as said liquid converts to gas.
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156. A method of converting a liquid to a gas as described in claim 155, further comprising the step of condensing a portion of said gas to a condensation surface.
157. A method of converting a liquid to a gas as described in claim 156, further comprising the step of transferring condensate to said solids using a condensate transfer surface.
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158. A method of converting a liquid to a gas as described in claim 157, further comprising the step of collecting a solution of said solids and said condensate at a location outside of said enclosure.
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